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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/572,590	03/20/2006	**Takashi Takeuchi**	043888-0456	3392

53080 7590 11/12/2008

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EXAMINER	
RINER, PHOEBE D	

ART UNIT	PAPER NUMBER
1795	

MAIL DATE	DELIVERY MODE
11/12/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/572,590	TAKEUCHI ET AL.	
	Examiner	Art Unit	
	PHOEBE RINER	1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *04 September 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-16* is/are pending in the application.

4a) Of the above claim(s) *16* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-15* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *20 March 2006* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *8/18/08, 1/29/08, 3/20/06*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

NON-AQUEOUS ELECTROLYTE SECONDARY BATTERY

Examiner: Riner S.N.: 10/572,590 Art Unit: 1795 November 16, 2008

Priority

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Election/Restrictions

2. Applicant's election without traverse of claims 1-15 is acknowledged. Accordingly, claim 16 is withdrawn from consideration as being directed to a non-elected invention. See 37 CFR 1.142(b) and MPEP 821.03.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1-4,6,7,13,15 are rejected under 35 U.S.C. 102 (b) as being anticipated by Tanaka et al (US 2003/0134200).

As to claim 1, Tanaka discloses a non-aqueous electrolyte secondary battery [0011] comprising a cathode (positive electrode), an anode (negative electrode) [0014], a separator [0022] between said cathode and anode (Figure 1), and an electrolyte [0037], wherein said positive electrode comprises a positive electrode active material

represented by a general formula: $Li_mM_xM'_yM''_zO_2$ where, M is Co, M' is Zn, Ti, Mg, and M" is Mg or Ca [0012], ($Li_xMe_{1-y-z}M_yL_zO_2$, where said element Me is at least one transition metal element except Ti, Mn, Y and Zr, said element M is at least one selected from the group consisting of Mr, Ti, Mn and Zn, and said element L is at least one selected from the group consisting of Al, Ca, Ba, Sr, Y and Zr). Tanaka discloses x is designated by an expression of $0.9 \leq x < 1$, y is indicated by an expression of $0.001 \leq y \leq 0.5$, z is indicated by an expression of $0 \leq z \leq 0.5$, and m is indicated by an expression of $0.5 \leq m$ (general formula satisfies $Li_xMe_{1-y-z}M_yL_zO_2$, where $1 \leq x \leq 1.05$, $0.005 \leq y \leq 0.1$ (with the proviso that $0.005 \leq y \leq 0.5$ is satisfied in the case of said element M being Mn) and $0 \leq z \leq 0.05$)) [0012]. Tanaka discloses the separator 13 (Figure 2) is composed of a porous film made of a polyolefine material such as polypropylene or polyethylene, or a porous film made and may have a structure that two or more kinds of these porous films are laminated [0036] (a plurality of laminated monolayer films) and microporous [0035] (microporous structure). Tanaka discloses a cathode 11 faces separator 13 (Figure 2) made of microporous polypropylene film [0170] (Figure 2) positive electrode-side monolayer film selected from said plurality of monolayer films which faces said positive electrode comprises polypropylene).

As to claim 2, Tanaka discloses wherein said element M (Me) is at least one kind of element selected from Ni and Co (wherein said element Me is Ni and/or Co) [0012].

As to claims 3 and 4, Tanaka discloses wherein said element M (Me) is at least one kind of element selected from Ni and Co (wherein said element Me includes Ni and Co) [0012] and wherein said element M' (M) is Mn [0013] and said general formula

satisfies $0.001 \leq y \leq 0.5$ (discloses $0.005 \leq y \leq 0.03$) [0012], [0013] and $0 \leq z \leq 0.5$ (discloses $0.01 \leq z \leq 0.05$).

As to claims 6 and 7, Tanaka discloses a method in which a lithium compound is prepared of the same general preparation as the claimed composite oxides of general formula invention ($Li_xMe_{1-y-z}M_yL_zO_2$). Tanaka discloses a compound containing lithium carbonate (Li.sub.2CO.sub.3), manganese dioxide (MnO.sub.2) and chromium trioxide (Cr.sub.2O.sub.3) mixed together. The mixture thus obtained was sintered in air at the temperature of 850.degree. C. for 5 hours to produce manganese-containing oxide LiMn.sub.1.8Cr.sub.0.2O.sub.4 containing lithium, manganese and chromium as a first element (Ma). Further, lithium hydroxide (LiOH), nickel monoxide (NiO) and cobalt monoxide (CoO) were mixed together and the mixture thus obtained was sintered in air at the temperature of 750. °C to produce nickel-containing oxide LiNi.sub.0.8Co.sub.0.2O.sub.2 containing lithium, nickel and cobalt as a second element (Mb) Then, the manganese-containing oxide and the nickel-containing oxide thus obtained were changed to particles having the average diameter of 5 m. After that, the pulverized and classified manganese-containing oxide and nickel-containing oxide were mixed in the weight ratio 4:6. [0158], [0159] (The composite oxides represented by the general formula: LixMel-y-zMyLzO2 can be synthesized by a method in which a compound containing the element Me, a lithium compound, a compound containing the element M and a compound containing the element L are pulverized and then mixed at a desired composition, followed by baking, or by solution reaction. The baking

temperature is preferably a temperature at which the mixed compound is partially decomposed or melted, namely 250 to 1500°C) .

However, it is the position of the examiner that the other properties of said material, are inherent, given that Tanaka uses the same approach to making the compound as that claimed (pulverizing, mixing the composition, followed by baking), Tanaka's compound achieves the same compositional gradient as that claimed. Therefore the particle distribution of said compounds would be inherent, namely, wherein said element M is uniformly distributed in said particle, and said element L is distributed more in a surface portion of said particle than an inside of said particle and wherein when a radius of said particle is r, said element L is distributed in a region within 0.3r from the surface of said particle at a concentration not less than 1.2 times higher than *that* in a region within 0.3r from the center of said particle. Therefore, the method of production disclosed by Tanaka and the present application are similar. A reference which is silent about a claimed invention's features is inherently anticipatory if the missing feature is necessarily present in that which is described in the reference. Inherency is not established by probabilities or possibilities. *In re Robertson,* 49 USPQ2d 1949 (1999).

As to claim 12, Tanaka discloses as the positive active material of the nonaqueous electrolyte secondary battery, lithium cobalt oxide, where a part of cobalt may be considered to be replaced by aluminum, which is an element high in bond energy with oxygen [0044].

As to claims 13 and 15, Tanaka discloses porous films are laminated [0036] (a plurality of laminated monolayer films); and a charging and discharging test carried out for the nonaqueous electrolyte secondary battery [0173]. It is noted that the method steps of claim 13, "wherein...films is formed by drawing a sheet obtained by extrusion..." and claim 15, "wherein said battery is charged by a charge control system whose end-of-charge voltage is set to not less than 4.3 V" are irrelevant, as the claim language states a product by process limitation, wherein the product of the instant application and that of Tanaka is the same. "Even though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same or obvious from a product of the prior art, the claim is unpatentable even thought the prior product was made by a different process. *In re Thorpe,* 227 USPQ 964, 966 (Fed. Cir 1985).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

7. Claims 5 and 8-12,14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tanaka et al. (US 2003/0134200), as applied to claims 1-4,6,7,13,15 above, and further in view of Lee et al. (US 2006/0188786).

As to claim 5, Tanaka discloses wherein said separator (which comprises positive electrode-side monolayer film) [0035], [0036] is composed of polyolefine material such as polypropylene or polyethylene and may have a structure that two or more kinds of these films are laminated (comprises polyethylene and polypropylene) [0035], [0036].

Tanaka does not disclose the amount of said polypropylene is not less than 60 wt% relative to the total amount of said polypropylene and said polyethylene.

Lee discloses a microporous film applied to a separator comprising a blend of polypropylene and polyethylene wherein 60 wt% of polypropylene and 40 wt% polyethylene are manufactured [0078] in order to improve the function of the separator [0027-0030]. Lee therefore recognizes the advantages to modifying the weight percent and ratio of polypropylene and polyethylene. Therefore the weight percent of polypropylene relative to the total amount of said polypropylene and said polyethylene is

a result effective variable. It has been held by the courts that discovering an optimum value or workable ranges of a result-effective variable involves only routine skill in the art, and thus not novel. *In re Boesch,* 617 F.2d 272, 205 USPQ 215 (CCPA 1980). See MPEP 2144.05.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Tanaka's separator so that the monolayer comprises 60 wt% of polypropylene and 40 wt% polyethylene because, as Lee teaches, modifying the weight percentages of polypropylene and polyethylene improve the function of the separator [0027-0030].

As to claims 8-11, Tanaka discloses microporous films are laminated [0036] (a plurality of laminated monolayer films), wherein the microporous films have a thickness of 50m (a thickness of not less than 8 micrometers) [0170]. Tanaka does not disclose wherein at least one selected from said plurality of monolayer films has a pore closing temperature of 110 to 140°C, nor the amount of said polypropylene is not greater than 20 wt% relative to the total amount of said polyethylene and said polypropylene.

Lee discloses a precursor film (of polypropylene and polyethylene [0078]) annealed at 120°C (falls within the claimed range of a pore closing temperature of 110 to 140°C") [0079]. It would have been obvious to one of skill in the art at the time of the invention to modify Tanaka's film thickness In relying upon the theory of inherency, the examiner must provide a basis in fact and/or technical reasoning to reasonably support the determination that the allegedly inherent characteristic necessarily flows from the

teaching of the applied prior art. *Ex parte Levy*, 17 USPQ2d 1461, 1464 (Bd. Pat. App. & Inter. 1990).

In the case of the instant application the basis for the expectation of inherency is that the materials, polypropylene and polyethylene film, used in Lee and Tanaka are the same. Since Tanaka uses the same materials as Lee, polypropylene and polyethylene film, it is inherent that Tanaka's polypropylene and polyethylene film achieves the same annealing temperature of 120°C and therefore teaches a pore closing temperature of 110 to 140°C.

Tanaka discloses the claimed invention except for said polyethylene film not facing the positive electrode. It would have been obvious to one having ordinary skill in the art at the time the invention was made to place said monolayer film whereby said film does not face said positive electrode, since it has been held that rearranging parts of an invention involves only routine skill in the art. *In re Japikse,* 86, USPQ 70.

Tanaka discloses wherein said separator (which comprises positive electrode-side monolayer film) [0035], [0036] is composed of polyolefine material such as polypropylene or polyethylene and may have a structure that two or more kinds of these films are laminated (comprises polyethylene and polypropylene) [0035], [0036].

Tanaka does not disclose the amount of said polypropylene is not greater than 20 wt% relative to the total amount of said polyethylene and said polypropylene.

Lee discloses a microporous film applied to a separator comprising a blend of polypropylene and polyethylene wherein the wt% of polypropylene and wt% polyethylene are manufactured [0078] in order to improve the function of the separator

[0027-0030]. Lee therefore recognizes the advantages to modifying the weight percent and ratio of polypropylene and polyethylene. Therefore the weight percent of polypropylene relative to the total amount of said polypropylene and said polyethylene is a result effective variable. It has been held by the courts that discovering an optimum value or workable ranges of a result-effective variable involves only routine skill in the art, and thus not novel. *In re Boesch,* 617 F.2d 272, 205 USPQ 215 (CCPA 1980). See MPEP 2144.05. It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Tanaka's separator so that the monolayer comprises the amount of said polypropylene is not greater than 20 wt% relative to the total amount of said polyethylene and said polypropylene because, as Lee teaches, modifying the weight percentages of polypropylene and polyethylene improve the function of the separator [0027-0030].

As to claim 12, Tanaka discloses a cathode 11 faces separator 13 (Figure 2) made of microporous polypropylene film [0170] (Figure 2) (positive electrode-side monolayer film), said film inherently has a thickness. Tanaka does not disclose wherein said monolayer film has a thickness of not less than 0.2 micrometers and not greater than 5 micrometers.

Lee discloses the advantages of varying the thickness of said monolayer films (Table 1, film thickness in micrometers). Lee therefore recognizes the advantages to modifying the thickness of said monolayer films. Therefore modifying the thickness of said monolayer films is a result effective variable. It has been held by the courts that discovering an optimum value or workable ranges of a result-effective variable involves

only routine skill in the art, and thus not novel. *In re Boesch,* 617 F.2d 272, 205 USPQ 215 (CCPA 1980). See MPEP 2144.05.

As to claim 14, Tanaka does not disclose wherein said positive electrode-side monolayer film has an average pore size D1 based on a total pore volume measured by a mercury intrusion method, and said monolayer film having a pore closing temperature of 110 to 140°C has an average pore size D2 based on a total pore volume measured by a mercury intrusion method, DI < D2 is satisfied.

Lee discloses the advantages of modifying the qualities (pore size) of the microporous film structure (Table 1, [0103]) in order to optimize the characteristics of the microporous film. Lee therefore recognizes the advantages to modifying the pore size of the microporous film structure (Table 1, [0103]) in order to optimize the characteristics of the microporous film. Therefore modifying the qualities (pore size) of the microporous film structure (Table 1, [0103]) in order to optimize the characteristics of the microporous film is a result effective variable. It has been held by the courts that discovering an optimum value or workable ranges of a result-effective variable involves only routine skill in the art, and thus not novel. *In re Boesch,* 617 F.2d 272, 205 USPQ 215 (CCPA 1980). See MPEP 2144.05.

Contact/Correspondence

Any inquiry concerning this communication or earlier communications from the examiner should be directed to PHOEBE RINER whose telephone number is (571)270-5269. The examiner can normally be reached on M-F from 8:30 a.m. to 6 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dah-Wei Yuan, can be reached on 571-272-1295. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Phoebe Riner/

Examiner, Art Unit 1795

/Dah-Wei D. Yuan/
Supervisory Patent Examiner, Art Unit 1795